

## A prospective study of the sexual, emotional and behavioral correlates associated with young women's first and subsequent coital events.

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### **Abstract:**

#### Context

First coitus is considered a major transitional event imbued with cultural relevance. Research has focused on classifying women as virgins, with primary interest in pregnancy and sexually transmitted infection prevention and less on sexuality. This study prospectively explored young women's sexual interest and love at first and subsequent coitus.

#### Methods

Daily diary data were collected during a longitudinal study of young women's sexual health (N = 387; 14–17 years at enrollment). Variables of interest included sexual interest, love, and contraceptive and disease prevention behaviors. Analysis of variance and multinomial logistic regression were utilized.

#### Results

For first coital events, love and sexual interest were reported about “half of the day,” with sexual interest significantly higher on the day of first coitus. Condom use was nine times more likely than no method at first compared to later coital events. For subsequent coitus, feeling of being in love was significantly higher compared to first coitus, with average sexual interest and love significantly higher with use of no contraceptive method over condoms. Condoms were associated with higher feelings of being in love, but lower sexual interest compared to hormonal contraception.

## Conclusions

The results indicated that sexual interest and love are independent components of coital behavior. Yet the results also suggest that young women's first coitus does not fully capture the expected significance of "losing one's virginity." Thus, at first coitus, women can actively engage in protective behaviors and focus on pleasure.

**Keywords:** sexual behavior | sexual health | sexual initiation | contraception | adolescent health

## Article:

First coitus is a developmental milestone of adolescence and young adulthood. Despite being a relatively brief event, first coitus is coupled with significant transformation [1]. This single coital act causes permanent loss of status as a "virgin," even if subsequent abstinence is life-long. Voluminous literature documents cultural, social, religious, and psychological influences on first coitus [2], [3] and [4]. However, few studies analyze the event-level characteristics of first coitus, even fewer prospectively compare a young woman's first coitus with her subsequent coital experiences, and none compare a young woman's first coitus to later coital experiences of other, sexually experienced women.

This study used daily diaries to describe young women's sexual interest, love, and mood on days associated with first coitus, compared to the day before and the day after first coitus. This permits assessment of these variables on the day of first coitus within the context of the sequence of days in which it occurred. The daily diaries also allowed us to compare sexual interest, love, and mood on the day on which first coitus occurs with sexual interest, love and mood on days of second and subsequent coital events. We could also examine changes in condom use that may occur as early coital experience accrues. Finally, the daily diaries permitted us to compare days of young women's first coitus to the days on which sexually experienced women have coitus. This allowed insight into whether first coitus can be differentiated in some way from coital events of sexually experienced women.

## Methods

### Study design

Data were collected as part of a longitudinal cohort study of sexual relationships, sexual behaviors, and sexually transmitted infections (STIs) among adolescent women [5], [6] and [7]. As part of the larger study (initiated in 1999, with follow-up completed in 2009), young women completed alternating 84-day diary collection time frames over a period of up to 8 years. All collection time frames were followed by a rest period in which no diary information was

collected, and each collection period was bracketed with a clinic visit for collection of interview and physical examination data related to the larger project. This research was approved by the institutional review board of Indiana University/Purdue University at Indianapolis–Clarian. Informed consent was obtained from each participant and permission obtained from a parent/legal guardian.

Two data collection instruments were used. First, a face-to-face interview with a trained research assistant was administered at the time of enrollment. The interview included a number of items about lifetime and recent sexual experiences, including coitus. The primary data collection instrument was a daily diary consisting of a single, bar coded, scannable sheet; pre-printed questions assessed the content of partner interactions (e.g., coitus, condom use) and subject information specific to that day (e.g., sexual interest, mood). Diaries were collected weekly and participants were compensated for completed diary entries. Behavior changes in response to diary completion are possible [8], but most research finds little or no short-term diary reactivity [9].

## Participants

Participants were 387 adolescent women receiving health care as part of the patient population in one of three primary care adolescent health clinics in Indianapolis, IN. These clinics serve primarily lower- and middle-income families residing in areas with high rates of unintended pregnancy and STIs. The average maternal education was 12th grade. Most participants (90%) were African American. Participants were eligible if they were 14–17 years of age, spoke English, and were not pregnant at the time of enrollment (women were permitted to continue if they became pregnant during study period).

## Identification of first coitus

Interviews and daily diaries were used to find days of first coitus. First, using interviews, we classified young women (98/387; 25.4%) without prior sexual experience at enrollment as those who answered “no” to the questions “Have you ever had vaginal sex in your lifetime?” and “Have you had vaginal sex in the past 3 months?”

From these 98, we excluded 36 (36.7%) subjects with inconsistent data. About one-third (14/36; 38.8%) were omitted because their follow-up interviews were inconsistent after enrollment (e.g., a subject responded “no” to the question “Have you ever had vaginal sex in your lifetime?” after

an affirmative response). The other 22 (61.1%) had diaries that were incongruent with interviews. No significant differences in age, race/ethnicity, substance use, or depression were noted between these women and the final sample.

Of the 62 subjects retained for analysis, 21 (33.9%) first reported lifetime coital experience in an interview immediately after a 3-month period in which diaries were not collected. For the remaining 41 subjects with first coitus recorded during a diary period, we examined those diaries to identify the date on which first coitus occurred.

## Measures

### Coital event variables

Three coital event variables were created for analyses. We identified the days of, prior to, and after first coitus and created a three-category variable: day relative to first coitus. We also created an ordinal sequence of coital events: order of coital events (first through 10th event)—with first and then subsequent events (second through 10th event). These measures were used for within-subject analyses for the sample of 41 participants with first coitus recorded during a diary period. Finally, using diaries from the entire sample of 387, we created a dichotomous variable (first coitus [no/yes]) to compare coitus on days that were quotidian coital events to days that were first coital events. This analysis allows identification of differences of days on which coitus first occurs from the many usual (or quotidian) coital events that occur in sexually experienced women's lives.

### Outcome variables

Affective variables included additive indices of 5-point Likert type items, positive mood ( $\alpha = .86$ ; e.g., “I felt happy”) and negative mood ( $\alpha = .83$ ; e.g., “I felt mad”), as well as single 5-point items of sexual interest and feeling in love—that asks young women to describe how they felt that day from “Not at all” to “All day.”

Relational variables included additive indices of dichotomous (no/yes) items, partner support (three-items;  $\alpha = .95$ ; e.g., “He made me feel loved”) and partner negativity (three items;  $\alpha = .93$ ; e.g., “He made me feel disrespected”). We also assessed condom use (no/yes) and contraceptive repertoire (none, hormonal contraceptive, condom, or hormonal contraceptive and condom) for all coital events.

## Procedure

Within-individual differences in sexual interest, love, and mood for the days surrounding first coitus and on usual coital days were assessed using repeated measures analysis of variance and post hoc tests. Between-individual analyses used bootstrap sampling methods to address the disparity in sample sizes between days associated with first coitus and those associated with quotidian coitus. Bootstrap methods involve repeated random sampling (with replacement) to produce multiple samples to provide an estimate of the parameter of interest. We generated a sampling t-test distribution, thereby producing adjusted standard errors and confidence intervals around observed effects [10]. Differences in contraceptive repertoire in the between-subject analyses were assessed using multinomial logistic regression. All analyses were performed using SPSS 15.0 and Stata 10.0/SE with effects significant at  $p < .05$ .

## Results

### Enrollment characteristics

Participants without coital experience at enrollment were younger ( $M = 15.34$ ,  $SD = .22$ ) than those with coital experience ( $M = 15.91$ ,  $SD = .05$ ;  $t = 2.850$ ,  $df = 385$ ,  $p = .005$ ). However, those with and without lifetime coital experience did not differ on other enrollment characteristics, such as race/ethnicity, religiosity, or depression.

Focusing on non-coital sexual experience reported by interview, about one-third of those without coital experience at enrollment (34.1%; 14/41) had either touched partner's genitals or had genitals touched by a partner. Most reported touching or kissing of their breasts by a partner (85.4%; 35/41), whereas few had experienced either cunnilingus (2.4%; 1/41) or fellatio (2.4%; 1/41).

### Within-individual factors

We examined within-subject differences in average sexual interest, love, and mood on days surrounding first coitus. Sexual interest was significantly higher ( $p = .042$ ) on the day of first coitus compared to day after, but not significantly different from day before. Feeling in love was higher on the day before first coitus compared to the day of first coitus, but decreased on the day after first coitus. However, these differences were not statistically significant. Partner support was significantly higher on the day of first coitus compared to the day before ( $p = .031$ ), but was

not significantly different from the day after first coitus. There were no statistical differences in positive or negative mood or in partner negativity on the days surrounding first coitus (Table 1).

Condom use at first coitus was not significantly different from condom nonuse at first coitus by age, sexual interest, feeling in love, positive or negative mood, or partner support; however, partner negativity was associated with condom use over condom nonuse at first coitus ( $t = 3.37$ ;  $p < .05$ ).

We next focused on within-individual differences of first coitus compared to subsequent coital events (second through 10th event). Young women's sexual interest, being in love, positive mood, negative mood, partner support, and partner negativity remained stable from her first to following coital events. (data not shown, available from first author).

Condom use (compared to no condom use) at first coitus compared to following (second through 10th) subsequent coital events was associated with older age ( $t [12,890] = 20.36$ ,  $p < .001$ ), higher sexual interest ( $t [12,890] = 4.42$ ,  $p < .001$ ), and higher feelings of love ( $t [12,890] = 14.41$ ,  $p < .001$ ) (Table 1).

## Between-individual comparisons

### Affective

Next, we addressed differences in sexual interest, love, mood, and contraceptive behavior across first coitus compared to other coital events. Across all diary days, women contributed 14,538 total coital events. Of these, 41 (.3%) were associated with first coitus; the majority (99.7%; 14,497/14,539) reflected later coital events. Sexual interest, partner support, partner negativity, positive mood, and negative mood were not significantly different. Feeling in love, however, was significantly higher at usual coitus compared to first coitus ( $t = 1.77$ ,  $df = 34,138$ ,  $p < .05$ ). We calculated an achieved significance level for the bootstrapped value by centering the means of both samples [11]. This procedure yielded a  $p$  value of .002, suggesting that in less than .2% of all samples drawn would the average feelings of love be the same for first and quotidian coital events (Table 1).

Table 1.

Within and between individual analyses of affect on and following first coitus

	Within individual analyses							Between individual analyses		
	Days surrounding first coitus (M [SD])				Condom use at first coitus (M [SD])			Type of coital day (M [SD])		
	Day before	Day of	Day after	F	No	Yes	t	First coitus	Subsequent coitus	t
Sexual interest	2.07 (1.55)	3.07 (1.39)	1.90 (1.46)	3.201 (2.96) <sup>a</sup>	2.33 (2.30)	3.27 (1.10)	−1.04	3.07 (1.38)	2.92 (1.38)	−.41
Feeling in love	2.96 (1.72)	3.47 (1.75)	3.34 (1.71)	.730 (2.94)	3.01 (1.96)	3.80 (1.54)	−1.33	3.47 (1.74)	3.64 (1.58)	1.77 <sup>a</sup>
Positive mood	9.93 (4.11)	9.35 (4.39)	9.35 (3.78)	.218 (2.92)	9.78 (4.66)	9.05 (4.29)	.47	9.35 (4.39)	10.19 (3.59)	1.36
Negative mood	5.43 (3.01)	5.71 (3.63)	5.19 (2.61)	.203 (2.92)	5.64 (3.31)	5.75 (3.91)	−.08	5.70 (3.63)	5.24 (2.64)	−1.01
Partner support	2.65 (1.78)	3.48 (1.16)	3.15 (1.24)	3.317 (2.92) <sup>a</sup>	3.27 (1.31)	3.65 (1.02)	−1.02	3.48 (1.16)	3.27 (1.18)	1.16
Partner negativity	2.14 (.57)	1.71 (.33)	1.81 (.54)	.508 (2.92)	1.45 (.50)	1.88 (.28)	3.37 <sup>a</sup>	1.56 (.33)	1.43 (.67)	1.28

<sup>a</sup>  $p < .05$ .

## Contraception

We used multinomial logistic regression to compare contraceptive repertoire between young women's first and the usual coital events of the sexually experienced sample. About 50% (23/41) of first events and about 30% (4082/14,230) of usual events were condom protected ( $\chi^2 = 13.42$ ,  $df = 1$ ,  $p < .001$ ; OR = 9.69; 95% CI: 3.34–28.09). Hormonal contraception was less likely with first coital events (7.3%; 3/41) than with usual coital events (9.9%; 1,408/14,230). There was a significant difference in protection choice by coitus type—first compared to usual events ( $\chi^2 = 16.35$ ,  $df = 3$ ,  $p < .001$ ). About 40% (17/41) of first coital events and 60% (8,788/14,230) of usual coital events had no reported hormonal or barrier contraceptive method. About 5% of first

(2/41) and quotidian (622/14,230) coital events were associated with both condom and hormonal contraceptive use.

## Discussion

This study examined young women's first coital experiences compared to prior and successive days, with their own subsequent coital experiences, and with usual coital events of women entering the study with coital experience. The results indicate differences in sexual interest, love, and protective behaviors that give practical meaning to the phrase “sexual experience” and have clinical and educational implications.

### Sexual and emotional correlates of first coitus

On the day of first coitus, young women reported sexual interest and feelings of love that were significantly higher compared to the day after first coitus. This suggests that sexual interest is associated with coital initiation and that first events are not simply driven by male sexual interest [12] and [13]. An emerging literature emphasizes the importance of young women's sexual agency as an important element of healthy sexual development [14], [15], [16] and [17].

Although not statistically significant, feeling in love increased from day before to day of first coitus, and decreased to the day after first coitus. Feeling in love was significantly higher at usual versus first coitus. No statistical differences were noted in the affective and relational factors surrounding young women's first coital events. Although research has focused on the role of love in sexual decision-making [18] and [19], our results suggest that love and sexual interest are contributing elements of the process. Overall, these findings suggest that while first coitus is an important moment (in terms of potential outcomes) [1], [11] and [20], the significance of this particular event is lower than expected.

### Sexual and behavioral correlates of first coitus

It is estimated that one in four U.S. adolescent women is infected with an STI [21]. This coupled with high rates of unintended pregnancy [22] make adolescents' contraceptive repertoire of increasing public health interest. The intersection of age, race, and class has an important relationship with sexual and contraceptive behaviors [23] and [24]. The cultural and individual differences in social meanings associated with first coitus and parenthood may affect use of protection [23]. Research contends that African American women initiate sex earlier and are less likely to use contraception; however, African Americans are also more likely to discuss condoms



and contraception before coitus [25]. In this sample of primarily African American women, condom use was relatively consistent at first and usual coitus. Furthermore, the rate of condom use in association with corresponding higher levels of sexual interest and love is in concert with contraception use being higher with a “greater wantedness of first sex” [15]. Condoms were nine times more likely to be used at first coitus compared with usual events, affirming research suggesting a decline in condom use, often accompanied by an increase in hormonal contraception, over time and course of relationships [7], [23] and [26]. Adolescent women may use hormonal methods less efficiently than their older counterparts [27]; thus, health care providers and educators should continue to promote condom use for STI and pregnancy prevention (even for individuals who have taken a virginity pledge [28]).

Although higher levels of sexual interest and love at usual coitus were associated with no method use over condom use, in general condom use at quotidian coital events was associated with higher levels of sexual interest and love. Interestingly, condom use, in relation to hormonal contraceptive use, at usual events was also related to lower levels of sexual interest. This latter relationship between condoms and love may be related to women's desire for increased intimacy when feeling in love, whereas the increase in condom use with lower sexual interest may reflect a decrease in sensation accompanied with using condoms [23]. The complex relationship between sexual interest, love, and condom use highlights a need for more integrated health programs that acknowledge the role of these factors on sexual decision-making, while encouraging options that can increase comfort (e.g., lubricant use with condoms). Although condoms were the method of choice compared to hormonal contraception, it is notable that 5% of both first and quotidian coital events were associated with dual method use. Less encouraging is the rate of no method use at first (40%) and usual (60%) coitus. This underscores the need for targeted interventions to increase use of hormonal and barrier protection methods at all coital events.

### Limitations and future directions

The study participants may be distinct in their willingness to respond to sexual health questions; thus, their experiences may not be reflective of other women. However, while a wide range of factors have been identified as influences on first coitus [2], [3], [4] and [29], our sample was relatively demographically homogenous which allowed us to control for some of these factors. Research has demonstrated that early initiators are more likely to have experienced a sexually coercive event [30]; it is possible that some women entered the study with coerced sexual experience, thus explaining some of the differences in protective behaviors between women. In addition, we did not ask if any of the coital events were (non)consensual, which has the potential to affect young women's assessment of any experience.

A major strength of this study (over retrospective or cross-sectional studies) is that daily diaries allowed event-specific information to be collected prospectively; this is useful in decreasing recall bias. However, the diaries do not establish the temporal order of specific events, leaving us unable to disentangle within-day causal order of one event relative to another. For example, it is possible that feeling “in love” with one's partner leads to a more favorable rating of sexual interest of first coitus or that first coitus leads to an increase in feelings of love. Adolescents can be inconsistent in reporting first coitus; however, young women are more accurate than their male peers [31] and [32]. Although there was some evidence of inconsistent reporting, we had available multiple forms of data to check for accuracy.

Although we attained a unique data set of first coital events, the small sample size limited our ability to detect significant differences. Thus, the results should be interpreted with caution. It is probable, however, that the trends seen would be significant in a larger sample. Our use of the bootstrap technique [10] was useful in dealing with the sample size differences between women with and without coital experience at enrollment. Future studies should continue to examine the event-specific variables, including sexual interest and love, associated with first coitus and recruit a larger sample of young women from a variety of backgrounds (e.g., racial/ethnic, socioeconomic status) before they initiate coitus.

## Conclusions

Although a variety of predictors of adolescents' first coitus have been explored, the influence of sexual interest and love have largely been overlooked. Our findings suggest that these variables are independently associated with sexual behavior. They are responsive to first coital experiences and indicate that first coitus is a sexual event. At the same time, our findings suggest that young women's first coitus does not fully capture the social and psychological significance in which “losing one's virginity” is suggested to have [1]. This lower level of symbolic significance allows young women to be more proactive in engaging in protective behaviors and focusing on pleasure at first and quotidian coitus. The increased attention to women's experience of first coitus has implications for incorporating a focus on protective behaviors into interactions with health care providers. It remains important that providers' acknowledge that first coitus is one, but not the only component in the sexual lives of young women. Although first coitus can represent a significant event in an adolescents' life, it does not change the status of future health care needs.

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